THE AUK:

A QUARTERLY JOURNAL OF ORNITHOLOGY.

VOL. II. OCTOBER, 1885. No. 4.

ON THE BREEDING HABITS OF SOME ARIZONA BIRDS.

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FOURTH PAPER. *Vireo vicinior*.

THE investigation of the bird fauna of the cañon described in detail in the first paper of this series proved so interesting that I was rarely tempted outside of a very limited region during that part of the year 1884 preceding October 1, and a number of species that did not attract my attention at all during that period proved not only to be abundant on the mesas and foot-hills of the region immediately adjoining, but were of the greatest interest on account of their heretofore supposed rarity. Chief among these birds stands the Arizona or Gray Vireo (*Vireo vicinior*), of which, so far as I can learn, only about a dozen individuals have been procured since its discovery and description by Dr. Coues in 1866. This species, on the San Pedro River foot-hills of Las Sierras de Santa Catalina, at an altitude ranging from 2800 to 4000 feet (which is here the point of meeting of the mesquite timber and the evergreen oaks), is, excepting the Least Vireo (*Vireo pusillus*), the commonest form of Vireo, being fairly abundant, as the following notes will show.

The two altitudes mentioned seem to be about the limits of the species while breeding, and most of the birds secured were

obtained between 3000 and 3500 feet altitude. Once, during the season of 1884, on June 26, I met with the Arizona Vireo. This one had probably strayed rather outside of the usual range, and was at a considerably higher altitude — well within the oak belt — than any since obtained. The locality where the species is most abundant is where the mesquites terminate and the oaks begin; there being of course a sort of gradual transition and no well or clearly defined line, the two forms of trees being mingled about equally. I have found that the smooth flat mesas, and the broad open bottoms of the wider cañons are quite as much frequented by them as the rough and broken hillsides, and it is difficult to ride about anywhere between the altitudes above mentioned, without hearing the very characteristic song of the species. In the trees and bushes they rarely go higher than fifteen feet from the ground, and though I have several times seen them *on* the ground, yet the limbs about ten feet from it seem to be the most frequented. The birds are exceedingly active, and, though not very shy, are difficult to procure, for as soon as one tree or bush has been well and very rapidly hunted over for food, a rather long flight, not by any means to the nearest tree or bush, is made; and by the time the collector is in range again the song is very likely to be heard at considerable distance.

This song is clear and liquid in character, and is kept up so continually as to betray the presence of the male bird, which I believe monopolizes it, even a quarter of a mile away, under favorable circumstances. It is composed of single whistling notes, generally delivered rather slowly, and seemingly with hesitation, and in an abstracted way, as if the performer were thinking the while of other affairs; and yet frequently this sort of abstraction seems cast aside, and the same series of notes are given with a precision and brilliancy that calls to mind a fine performance of a Scarlet Tanager, or even of a Robin.

The first arrival in my neighborhood this year (1885) was on April 1, when I took a male in full song. This was in a pretty rolling grass country, where the trees are rather scattered, and at an altitude of 3500 feet. The next day another male was secured, and I think the arrival must have become general by the 10th to 12th, though, as I was called away about this time, I cannot be positive. On my return I went to the pine woods of this vicinity, and so my note book says nothing about Gray Vireos for more

than a month; for, on my return from the pines, about May 1, I was fully occupied with looking after some of the rarer Hummingbirds.

My notes take up the story of this species again on May 19, when I surprised myself by taking three males, and began to realize that another rarity among my bird neighbors was possibly common. Of this I became sure in a few days, as I took four more males on the 20th, and seven males again on the 26th of May, though it was not until the 31st of the month that I secured a female of the species, although my series then included twenty-four male birds. Among the seven individuals procured on the 26th of May were two young males that had just left the nest and were under the care of the male parent bird. So the first breeding must begin very soon after the arrival of the species.

On this day, too, I found a nest, to be presently described, which was just finished. I saw both parents, the female sitting on the nest, and the male singing in the bushes close at hand. The female was very tame, and in order to see the interior of the nest I was obliged to touch her with my fingers before she would leave her home. Several times afterwards, in watching the progress of laying, I was obliged to repeat this action, and once had to lift the bird out of the nest. On May 26, when I discovered the nest, then apparently finished, it contained no eggs, although the female was sitting very close, as I have described. Daily visits to the spot showed the same circumstances obtaining until May 30, when the first egg was laid; and then an egg was laid daily until June 2, when the laying was completed, four eggs being in this case the full set. Thus the female, after the nest was apparently completed, was constantly sitting on the nest, it being all the time empty, for four days. The habit of sitting on a finished nest for a considerable time before *any* eggs are laid also obtains among certain other species of this region, and seems, from my experience, very characteristic of the Arizona Jay (*Aphelocoma sordida arizonæ*); but of this I shall have more to say in detail in another place.

On the 2d of June I took this nest, then containing four eggs, as well as both the parent birds (Nos. 2714 ♀, and 2711 ♂), the female being taken from the nest in my hand. And also on the same day, at a point about a mile distant, I obtained a second nest containing young, three in number, about ready to leave the

nest. On June 4 I found a pair of these birds just starting to build; but this was the second brooding, as the female of the pair, which I took before I discovered the nest, clearly showed. And also on this day I found the first *fully fledged* young shifting for themselves. June 6 was the date on which I found a second nest containing three eggs, slightly incubated, the female of this nest being catalogued as No. 2757. On the same day I also found a completed nest on which the female was sitting, as before described, but which contained *no* eggs as yet, and it being at rather a remote point I did not visit it again.

My notes as to time of nesting are concluded on June 11, when I found a pair just beginning a nest, and another pair with a nest about half finished, both nests being situated in mesquites about seven feet from the ground, in smooth, flat country, at an altitude of about 3500 feet.

From the nests obtained, which are before me as I write, and from notes as to their location, etc., I append the following details.

Nest of June 2. Built in a kind of thorn bush, almost at the extremity of one of the upper and overhanging branches, six feet from the ground. It is composed externally of the dry outside skin or bark of a coarse kind of grass, rather loosely woven. But immediately beneath this loose, external layer is a wall of the same material, very closely and strongly woven. The lining of the nest, which is very distinct from the walls, extends throughout the interior. It is much thicker on the bottom of the structure, but extends up to the rim, where, however, it is thin. It is composed of fine dry grasses, arranged on the sides of the nest in concentric layers, much as the horse-hairs are placed in the nest of *Spizella domestica*. On the bottom this arrangement does not obtain, but the grasses cross one another seemingly at random, forming a soft mat. The walls are uniformly about one-fourth of an inch in thickness, and the shape of the entire structure is that of a half sphere. The external diameter at the rim is two and three-fourths inches, and the diameter at the same point inside is two and one-quarter inches. The depth outside is two inches, and inside one inch and three-quarters. The nest is attached at the rim for almost the entire circumference very much like a Red-eyed Vireo's nest, but here the resemblance ceases, for it is not fastened to the many

small twigs, on which it rests, that pass diagonally downward, so that it is not even a semi-pensile structure. The thorns of the bush, which are from an inch and a half to two inches long and very sharp, protect the nest in every direction, for the whole is entirely surrounded by twigs and small branches. Its contents are four eggs, rather rounded in general shape, though one end is somewhat sharper than the other. The ground-color is rosy when fresh, becoming a dead white when blown, rather sparsely spotted with irregularly shaped dark umber brown dots, chiefly at the larger end. One of the eggs is unfortunately too badly broken to measure, but is not apparently very different from the other three, which measure, respectively, .77 × .59, .78 × .58, and .75 × .57 inches. This nest was obtained on the side of a hill near the bottom of a rather broad cañon, at an altitude of 3500 feet. The structure is, as a whole, very symmetrical, but is widely different from that of other Vireos which breed in the neighborhood.

The nest of June 2, which contained three young, was built in a mesquite, growing on a little mesa in flat country, the altitude being about 3500 feet. It was not quite six feet from the ground, and is composed externally much like the last, with the addition of some thin broad shreds of mesquite bark to the material already described. It is not at all symmetrical, however, and presents a rather careless appearance as a whole. It is built near the centre of the tree, in a upright V, formed by two upright limbs, the larger being an inch and the smaller five-eighths of an inch in diameter. But the rim is attached for almost half an inch of its circumference to a small twig, which, reaching out from another branch at considerable distance, crosses the two upright limbs forming the V at right angles. The attachment to this small twig, it will be noticed, is very slight, and on the other side of the nest the rim is attached for an inch to a twig which makes out from the larger of the two upright limbs. The bottom of the nest outside does not quite rest in the angle of the V, but the sides rest firmly against the limbs forming it, and the result is a Vireo's nest resting in a crotch, and in no degree pensile. The largest external diameter is three and the smallest two and a half inches; the walls are exceedingly thin except at the rim and bottom, and loosely constructed. The largest interior diameter is two and five-eighths and the smallest two and one-

eighth inches. The exterior depth is two inches and a quarter and the interior depth one inch and three quarters.

The nest of June 6, which will complete the present series, was found in a locality similar to the nest first described, at an altitude of 3000 feet. It was built in a 'catclaw'—a kind of small mesquite—four feet from the ground. The situation was at the extremity of a branch in a horizontal V-shaped fork, to which two-thirds of the rim is fastened, the other third being free. But considerable support was afforded, directly underneath the nest, by a small twig, which is fastened into the structure. The materials do not vary from those of the first nest of June 2 already described, either inside or out, except that a few downy feathers are added to the lining. The whole is a symmetrical half-sphere in shape. External diameter, two and three-fourths inches; interior diameter, two and one-fourth inches. Exterior depth, two inches; interior depth, one inch and three-quarters. It contained three slightly incubated eggs, which do not vary in color from those already described, except that the spots are of a slightly redder brown, and they are more concentrated at the larger end. The eggs are rather smaller and even more rounded in general shape than the other set spoken of, being but little more pointed at one end than at the other. They measure .72 × .53, .70 × .55, and .68 × .53 inches, respectively.

My series of this species at present numbers fifty-four specimens—forty-two males and twelve females—all taken, with the one exception noted above, between April 1 and June 11 of the present year. They present very little variation in size or color, and the young in first plumage do not differ materially from the adult birds.

LIST OF BIRDS OBSERVED IN SUMMER AND FALL ON THE UPPER PECOS RIVER, NEW MEXICO.

BY H. W. HENSHAW.

THE observations embodied in the following list were made during the interval between July 18 and October 28, 1883, by